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New Planthoppers of the Tribe Achilini (Homoptera, Fulgoroidea, Achilidae) from Baltic Amber

A. F. Emeljanov[a] and D. E. Shcherbakov[b]

[a]*Zoological Institute, Russian Academy of Sciences, Universitetskaya nab. 1, St. Petersburg, 199034 Russia*
e-mail: hemipt@zin.ru

[b]*Borissiak Paleontological Institute, Russian Academy of Sciences, Profsoyuznaya ul. 123, Moscow, 117997 Russia*
e-mail: dshh@narod.ru

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Abstract—New taxa of Achilini (Achilidae) are described from Baltic amber: *Paratesum rasnitsyni* gen. et sp. nov., *Protomenocria notata* gen. et sp. nov., *Psycheona variegata* gen. et sp. nov., *P. striata* sp. nov. *Protepiptera kaweckii* Usinger, 1939 (= *Cixidia christinae* Lefebvre, Bourgoin et Nel, 2007, syn. nov.) is redescribed with designation of a neotype. *"Cixius" testudinarius* Germar et Berendt, 1856, *"C." longirostris* Germar et Berendt, 1856 and *"Oliarus" oligocenus* Cockerell, 1910 are transferred to Achilini. A key to the genera of Achilidae known from Baltic amber is provided.

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INTRODUCTION

The family Achilidae was first reported from Baltic amber by Usinger (1939), who described the genus *Protepiptera* Us. with a single species, *P. kaweckii* Us. In their classical paper Germar and Berendt (1856) described several undoubted Achilidae in non-achilid genera: a late instar nymph (termed "pupa") of *"Dictyophara (=Pseudophana)" reticulata* (G. et B.) (see Emeljanov, 1983) and adult *"Cixius" testudinarius* G. et B. and *"C." longirostris* G. et B. The two latter species are placed herein in the tribe Achilini (see below Remarks to *Protomenocria* gen. nov. and *Protepiptera* Us.); the tribe is treated in the broad sense, including the subtribes Elidipterina and Cixidiina (Emeljanov, 1991, 1992). Among six other species described by Germar and Berendt in the genus *Cixius, Balticixius insignis* (G. et B.) (Lefebvre et al., 2007) and *"C." vitreus* G. et B. are true Cixiidae, whereas *Jantaritambia loculata* (G. et B.) and *"C." succineus* G. et B. are Tropiduchidae (Jantaritambiini; Shcherbakov, 2006). It is hard to decide whether *"C." sieboldii* G. et B., placed by Szwedo et al. (2004) in Achilidae, actually belongs to that family, because the clavus of the specimen is illustrated incorrectly or incompletely, and the distal part of its tegmen lacks any diagnostic characters of Achilidae. The types of the species described by Germar and Berendt appear to be lost (Szwedo et al., 2004). Another species, *"Oliarus" oligocenus* Cock., described by Cockerell (1910) as a member of Cixiidae, belongs to Achilidae (Szwedo et al., 2004), probably to the genus *Protepiptera* (see below).

Besides that, two other tribes of the family Achilidae were described from Baltic amber: Ptychoptilini, comprising two genera with three species (Emeljanov, 1990; Szwedo and Stroinski, 2001; Szwedo et al., 2004), and monotypic Waghildini (Szwedo 2006), closely related to Achilini. Two additional representatives of Achilini from Baltic amber have been recently described by Lefebvre et al. (2007): a monotypic genus *Angustachilus* Lefebvre, Bourgoin et Nel and *Cixidia christinae* L., B. et N. In our opinion, *Protepiptera kaweckii* Us. = *Cixidia christinae* L., B. et N., syn. nov. (see below). It is the most common achilid species in Baltic amber. The genus *Protepiptera* indeed belongs to the subtribe Cixidiina, as indicated by the hindwing venation and presence of subapical setae at the first and second hind tarsomeres. However, the division into subtribes is not included in the key below, because not all characters diagnostic of the subtribes are traceable on amber inclusions.

Three new genera with four new species, all belonging to Achilini in the broad sense, are described below. Comparison of the new genera with other genera from amber is given in the key. The material is deposited in the Paleontological Institute of the Russian Academy of Sciences, Moscow (PIN). The photographs were processed with the Helicon Focus 4.16 software.

SYSTEMATIC PALEONTOLOGY

Key to the Genera of Achilidae from Baltic Amber

1(2) Tegmina in repose with membranes folded lengthwise in their posterior parts and bent downwards

along nodal crossveins. M 2-branched. Coryphe ("vertex") oblong triangular. Ca. 4–5 mm long……Ptychoptilini

2(3) R and CuA forked before nodal level. Pronotum with 3 carinae……*Ptychoptilum* Emeljanov, 1990

3(2) R and CuA not forked before nodal level. Pronotum with 5 carinae……*Ptychogroehnia* Szwedo et Stroinski, 2001

4(1) Tegmina in repose with membranes not folded additionally. M with more than 2 branches. Coryphe of different shape. Larger.

5(6) Hind tibia flattened, with 6–8 lateral spines. Coryphe oblong pentagonal, separated from metope ("frons") by pair of triangular cells……Waghildini: *Waghilde* Szwedo, 2006

6(5) Hind tibia not flattened, with single lateral spine. Coryphe transverse; cells between coryphe and metope absent……Achilini

7(8) Tegmen broad, membrane occupying 1/2 its length, clavus with narrow, steeply inclined sutural area. RA strongly, almost angulately arched backwards below pterostigma. Costal area with recurrent oblique veins. Coryphe shorter medially than at eyes, without median carina. Pronotum short, lateral carinae of disc bent outwards, following eye margin, distant from posterior margin of pronotum. Subapical setae only on second hind tarsomere. Rostrum not long……*Paratesum* gen. nov.

8(7) Tegmen elongate, membrane at least slightly shorter than 1/2 its length, clavus with wider, less inclined sutural area. RA not arched backwards below pterostigma. Costal area without crossveins. Coryphe no shorter medially than at eyes, with median carina. Pronotum longer, lateral carinae of disc directed obliquely backwards, ending close to posterior margin of pronotum. Subapical setae on both first and second hind tarsomeres.

9(10) Costal area of tegmen, at level of ScR fork, twice as wide as radial area. Legs short. Rostrum not long. Metope barely narrowed dorsally; coryphe feebly narrowed anteriorly, its posterior part situated between eyes. Head together with eyes ca. 1.5 times narrower than mesonotum. Lateral carinae of mesonotal disc straight……*Protomenocria* gen. nov. (probably also *"Cixius" testudinarius* Germar et Berendt, 1856, possible senior synonym of *Protomenocria notata* sp. nov.; see Remarks to *Protomenocria* and *P. notata*)

10(9) Costal area not so broad. Legs relatively long. Rostrum very long. Metope considerably narrowed dorsally.

11(12) Tegmen with CuA_1 abruptly bent at nodal crossvein *mcu*, strongly arched backwards more distally, area between branches of CuA narrowing about three times. Head together with eyes nearly twice narrower than mesonotum. Coryphe situated between eyes, feebly narrowed anteriorly, separated from metope with only low carina, uppermost part of metope visible in dorsal view. Lateral carinae of mesonotal disc straight……*Psycheona* gen. nov.

12(11) CuA_1 not bent at nodal level, area between CuA branches less narrowing, if at all. Transocular head width not much less than width of mesonotum. Coryphe markedly narrowed anteriorly, situated almost entirely in front of eyes, metope not visible from above. Lateral carinae of mesonotal disc interrupted step-like near midlength.

13(14) Rostrum extended beyond tip of abdomen. Coryphe shorter, more inclined, separated from metope by smoothed carina……*Angustachilus* Lefebvre, Bourgoin et Nel, 2007

14(13) Rostrum not reaching tip of abdomen. Coryphe longer, less inclined, separated from metope by sharp carina……*Protepiptera* Usinger, 1939 (probably also *"Cixius" longirostris* Germar et Berendt, 1856 and *"Oliarus" oligocenus* Cockerell, 1910, possible senior synonyms of *Protepiptera kaweckii* Usinger, 1939; see Remarks to *Protepiptera*).

SYSTEMATIC PALEONTOLOGY

Family Achilidae Stål, 1866

Tribe Achilini s.l.

Genus *Paratesum* Emeljanov et Shcherbakov, gen. nov.

Etymology. From the generic name *Ateson* Metc. (fully Latinized form, *Atesum*) and the Greek *para-* (near).

Type species. *Paratesum rasnitsyni* sp. nov.; Upper Eocene, Baltic amber.

Diagnosis. Laterally compressed, with steeply tectiform tegmina, their membranes overlapping but slightly, only in postclaval areas (degree of overlap indicated by slight notch on tegmen margin at apex of anterior CuA_2 branch). Head with short transverse coryphe, its anterior margin straight, posterior concave (coryphe medially shorter than at eyes); coryphe without median carina but with two longitudinal carinae separating its lateral quarters from medial ones. Metope with sharp median carina, rectangular, almost twice as long as wide. Clypeus wedging into metope trapezoidally, not deeply. Lateral carinae of clypeus (continuing carinae of metope) sharp, nearly converging to median line, forming ca. 60° angle. Head in profile with coryphe inclined and face feebly deflected posteroventrally. Rostrum about as long as head from coryphe to rostrum, reaching posterior margin of hind coxae, its second and third (primary) segments of subequal length (however, tip of rostrum may be missing). Pronotum short, about 1.5 times as long as coryphe. Lateral carinae of disc smoothly curved outwards, running parallel to eye margins at distance from posterior margin of pronotum, reaching upper side lateral carinae. Median carina of disc sharp. Lateral margins of pronotum short, shorter than eye diameter, diverging. Mesonotum with

Plate 1


1


2


3


4

three sharp subparallel carinae, lateral lobes steeply inclined. Tegmen broad, 2.2 times as long as wide, obliquely truncate apically; membrane occupying half of tegmen length; clavus with sutural area narrow, steeply inclined. Costal area relatively broad, with indistinct recurrent oblique veins. Radius (ScRA-RP) with first fork somewhat basal to claval fork and about same level as first CuA fork. R and then RP up to nodal level more carinate than other veins. Nodal vein ScRA straight, slightly inclined (apex more distal). Stigmal cell short, with single crossvein in distal part. RA sharply, nearly angulately bent backwards below pterostigma, RP with 3 endings and crossvein after first fork; two rm crossveins present. Media separated from R slightly beyond arculus, with first fork at nodal level, posteriorly pectinate, with 4 branches, posterior branch being forked at level of subapical crossvein series. Nodal crossvein mcu proximal to first M fork. CuA_1 simple, CuA_2 with one fork, its oblique posterior branch crossing postclaval (posteriormost) area of membrane. Postclaval crossvein in middle part of postclaval area. Legs relatively short; hind tibia with single lateral spine slightly distal to midlength, without knee spine, at apex with concave row of eight teeth (medial end of row projecting farther than lateral). First hind tarsomere less than three times shorter than tibia, apically with seven teeth lacking subapical setae, second short, almost four times shorter than first, apically with six teeth bearing subapical setae, third nearly as long as second.

Composition. Type species.

Systematic position. In its tegminal venation the new genus is similar to Achilini and Achillini. The most reliable diagnostic character of these tribes, a plexus of anal veins in the hindwing anal area, is impossible to see in the only specimen known. However, the rostrum of *Paratesum* gen. nov. is of normal length and has a long apical segment, neither fitting the diagnosis of the tribe Achillini, characterized by the rostrum shortened and its apical segment particularly strongly shortened, not longer than wide. The tegminal venation agrees well with that characteristic of the tribe Achilini: CuA_2 is forked in the distal part of the membrane, with the anterior branch retaining the longitudinal course and the posterior deflected obliquely backwards. Another tribe with a similar fork on CuA_2, Myconini, is easily distinguishable by the rich branching of CuA_1 (maximum two branches in Achilini).

Comparison. In the broad costal area of tegmen, the new genus resembles recent Neotropical *Nelidia* Stål, *Elidiptera* Spinola, and similar genera. However, in *Elidiptera* apical parts of the membrane are bent under in repose and the venation in this area is deformed. In *Nelidia* the first fork of media is situated more distally and the head shape is different (the coryphe is smoothly continuing into metope, not separated by carina or edge). In both *Elidiptera* and *Nelidia* the stigmal cell has more than one crossvein.

***Paratesum rasnitsyni* Emeljanov et Shcherbakov, sp. nov.**

Plate 1, fig. 1

Etymology. After the paleoentomologist A.P. Rasnitsyn.

Holotype. PIN, no. 964/699; Upper Eocene, Baltic amber.

Description (Fig. 1a). Specimen in amber lying on its side (right tegmen partly spread out, right side obscured by milky layer), possibly somewhat compressed laterally during burial, so that steepness of tectiform wing posture became exaggerated; even when corrected for such artifact, wing folded rather steep, with membranes only narrowly overlapping. Hind wing venation not visible. Background color pale (possibly greenish) with brown areas: face and ocellar spot before second crossvein rm, dark brown; pronotum, thoracic venter, legs, clavus, adjacent corium (up to CuA and base of tegmen), posterior margin of membrane, and streaks along oblique veins in costal area, less dark brown; rest of corium and apical margin of membrane, pale brown.

Measurements (mm): tegmen length, 6.1.

Material. Holotype.

Genus *Protomenocria* Emeljanov et Shcherbakov, gen. nov.

Etymology. From the Greek *proto-* (simple, preceding) and the root of the generic name *Pseudomenocria* Fennah.

Type species. *Protomenocria notata* sp. nov., Upper Eocene, Baltic amber.

Diagnosis. Head of medium size relative to thorax, together with eyes about 1.5 times narrower than mesonotum, carinae on head sharp, spaces between them concave. Coryphe transverse, medially no shorter than at eyes, about twice as wide as long medially, anterior margin conspicuously bluntly angled, posterior margin almost arcuately concave, lateral margins slightly diverging backwards, median carina less high than others, not reaching anterior margin. Halves of coryphe with rounded matte areoles. Metope with subparallel sides, about twice as long as wide, in profile

Explanation of Plate 1

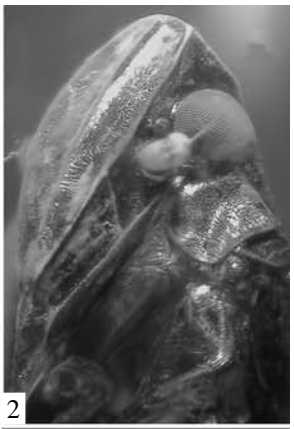
Fig. 1. *Paratesum rasnitsyni* gen. et sp. nov., holotype PIN, no. 964/699, habitus, ×15.7.

Figs. 2 and 3. *Psycheona variegata* gen. et sp. nov., holotype PIN, no. 964/698, habitus: (2) dorsal view, ×14.5; (3) lateral view, ×14.5.

Fig. 4. *P. striata* gen. et sp. nov., holotype PIN, no. 964/696, habitus, ×10.2.

Plate 2


1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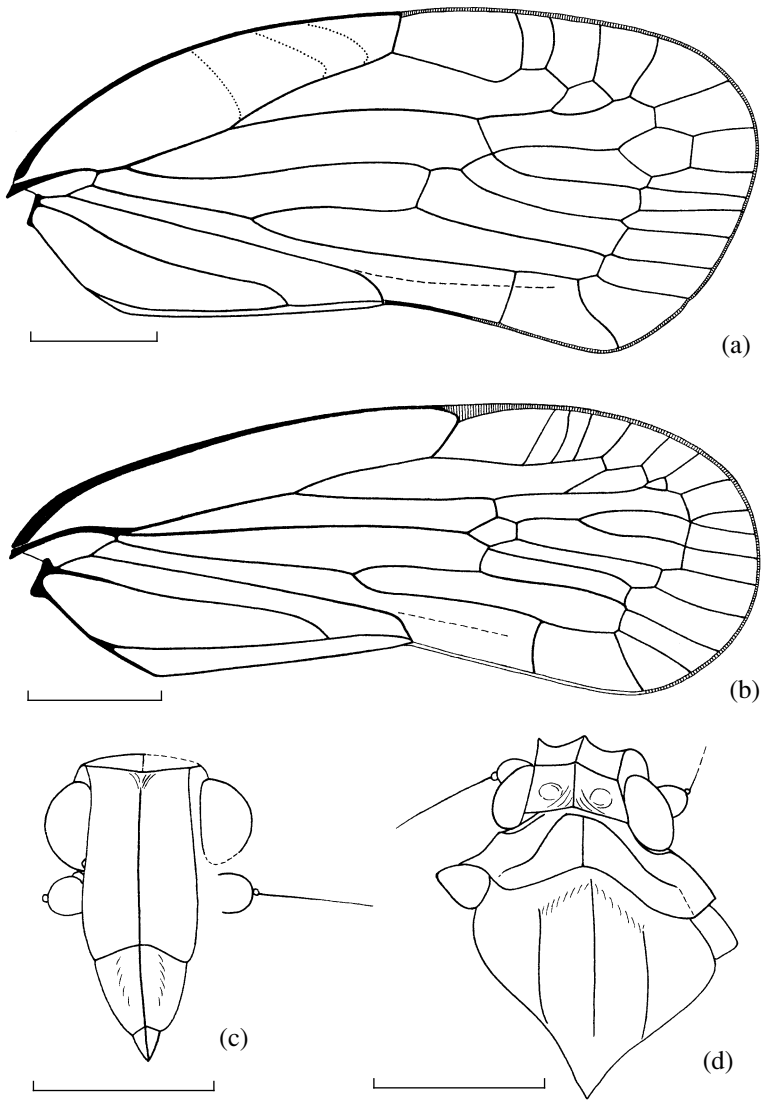

Fig. 1. Fossil Achilini: (a) *Paratesum rasnitsyni* gen. et sp. nov., holotype PIN, no. 964/699, tegmen; (b–d) *Protomenocria notata* gen. et sp. nov., holotype PIN, no. 363/83: (b) tegmen, (c) head, anteroventral, (d) forebody, dorsal.

convex, more so in upper half; median carina as sharp as lateral ones; boundary with postclypeus angulately concave. Postclypeus with sharp carinae, lateral ones convex, postclypeus somewhat longer than half length of metope. Eyes and antennae of regular structure. Rostrum reaching posterior margin of hind coxae. Pronotum relatively broad, its lateral carinate margin apparently formed by collateral carina. Anterior zone of disc separated by anterodiscal carinae running caudolaterally and smoothly continued into postocular and then into barely distinct lateral ones; without posterodiscal carinae; median carina of disc well developed. Mesonotum nearly diamond-shaped, with anterior margin obtusely angulate and posterior one better produced, forming acute angle. Mesonotal carinae sharp, subparallel, not converging or connecting anteriorly. Tegmen similar to *Protepiptera*, somewhat less elongate, 2.5 times as long as wide; membrane occupying nearly half of tegmen length; clavus with sutural area rather wide, shallowly inclined. Costal area at level of ScR fork twice as wide as radial area, in middle part parallel-sided, without crossveins. Crossveins in stigmal cell

Explanation of Plate 2

Figs. 1–3. *Protepiptera kaweckii* Usinger, 1939: (1) neotype PIN, no. 964/702, habitus, ×14.1; (2, 3) specimen PIN, no. 964/703, forebody, ×18.0: (2) ventrolateral and (3) dorsal views.

Fig. 4. *Protomenocria notata* gen. et sp. nov., holotype PIN, no. 363/83, habitus, ×16.0.

more or less inclined. ScR with first fork midway between arculus and pterostigma. RA not arched backwards below pterostigma. Nodal crossveins rm and mcu shifted distally, beyond first M fork. Subapical crossvein series uneven. Legs relatively short, hind tibia with single lateral spine distal to midlength. First hind tarsomere apically with no less than ten teeth, second with no less than eight teeth, both tarsomeres with subapical setae.

Comparison. The relatively broad pronotum with the lateral carinate margin formed by collateral carina is often found in the tribe, e.g., in recent genera *Dipsiathus* Em., from Australia, and *Catonidia* Uhl. In the concave posterior margin of coryphe and the weak lateral carinae of pronotum, the new genus is similar to *Catonidia*, but in the latter the crossveins in the stigmal cell are recurrent and the first hind tarsomere lacks subapical setae.

Remarks. *"Cixius" testudinarius* G. et B., placed in Achilidae by Usinger (1939), belongs to Achilini (the plexus of anal veins in the hindwing jugal area is partly drawn, the rostrum is not shortened). In the venation, head shape, and rostrum length, it matches *Protomenocria* gen. nov. and probably belongs to this genus. Judging from the drawing, in *"C." testudinarius* the nodal crossvein rm is much more distal than mcu, while the CuA fork is situated at the level of ScR and Pcu+A_1 forks. In contrast, in the holotype of *P. notata* sp. nov. the crossvein rm is nearly at the level of mcu, and the CuA fork is situated more distally. Nevertheless, a possibility that *"C." testudinarius* is conspecific with *P. notata* (see below) cannot be ruled out.

***Protomenocria notata* Emeljanov et Shcherbakov, sp. nov.**

Plate 2, fig. 4

Etymology. From the Latin *notatus* (marked).

Holotype. PIN, no. 363/83, male?; Upper Eocene, Baltic amber; left wings partly spread out, right ones folded, apex of right tegmen bent upwards, partly concealed by gas bubble and milky cloud, visible left side of body from gena to tip of abdomen covered with milky layer.

Description (Figs. 1b–1d). The body is brown with pale patches, including three striae along median carina and mediad of lateral carinae on mesonotum. ScR is forked much more proximal than CuA. The inverted fork of clavus is shifted distally, the vein Pcu+A_1 occupying about 1/5 of clavus length. The CuA fork is distal to the Pcu+A_1 fork. The pterostigma has three crossveins in its distal half. Nodal crossveins rm and mcu are situated nearly at the same level. RP is 3-branched; there are 3 ir crossveins. Tegmina with several pale brown, interrupted crossbands (including one along apical margin) on the pale background, and the darker spot in the stigmal cell just beyond the nodal fold, the spot at the Pcu+A_1 fork and several small spots in the costal and radial areas. The hindwing jugal area is folded under, but the plexus of anal veins is clearly visible.

Measurements (mm): tegmen length, 5.8.

Remarks. Besides the holotype, two larger specimens (females? PIN, no. 964/697 and from the collection of V.A. Gusakov) probably belong to this species. Their tegmina, 7.8–8.2 mm long, show a very similar dark pattern but are wider distally, with the nodal crossvein rm situated more distally than mcu and the CuA fork level with the ScR and Pcu+A_1 forks. Such differences may well be intraspecific, as, for example, in *P. kaweckii* (see below). Therefore, *P. notata* may turn out to be a synonym of *"C." testudinarius.*

Material. Holotype.

Genus *Protepiptera* Usinger, 1939

Type species. *Protepiptera kaweckii* Usinger, 1939, Upper Eocene, Baltic amber.

Diagnosis. Head and pronotum with strong, raised carinae, tegminal veins also raised. Head relatively large, together with eyes but slightly narrower than mesonotum. Coryphe less than twice as wide as long, medially no shorter than at eyes, roughly trapezoidal, but with anterior margin slightly angulately projecting, and posterior one slightly angulately emarginate. Coryphe with lateral margins markedly diverging posteriorly, anterior margin almost twice narrower than posterior one, the latter situated level with anterior margins of eyes; median carina distinct, turning weak anteriorly. Metope more than twice as long as wide, with dorsal margin (adjoining coryphe) and lateral margins weakly convex, dorsally somewhat narrower than ventrally (at postclypeus), widest slightly above antennae; median carina sharp; median ocellus absent; boundary with postclypeus indistinct, angulately concave. Postclypeus wedge-shaped, about 3/4 as long as metope, with sharp median and lateral carinae, lateral ones strongly converging ventrally, separated by slight step from carinae of anteclypeus. Anteclypeus with carinae weaker, converging near its midlength. Coryphe and metope in profile form acute, almost right angle, metope and postclypeus feebly convex. Rostrum very long, somewhat not reaching tip of abdomen, apex of penultimate segment extended beyond hind coxae. Antennae not large, with pedicel rounded. Pronotum with rather large, nearly trapezoidal disc that is nearly twice wider posteriorly than anteriorly, its lateral carinae nearly straight, directed obliquely backwards, somewhat not reaching posterior margin of pronotum, anterior margin straight, posterior one angulately concave. Sides of pronotum with one (lateral) carina. Mesonotum with anterior margin obtusely angulate and posterior one forming acute angle, slightly attenuated apically. Mesonotum with three distinct carinae, lateral ones slightly diverging backwards in anterior half, about midlength interrupted by more or less conspicuous step-like break and slightly displaced medially,

subparallel beyond. Tegmen quite elongate, 2.6–2.7 times as long as wide; membrane occupying almost 4/9 of tegmen length; clavus with sutural area rather wide, shallowly inclined. Larger (female?) tegmina (Fig. 2a) tend to be wider distally and more obliquely rounded apically than smaller (male?) ones (Fig. 2b). Costal area in middle part parallel-sided, rather narrow, without crossveins. R and M forming short common stalk beyond basal cell. ScR and CuA bifurcate at same level or CuA bifurcates more distally. Pterostigma with three or four crossveins. RA not arched backwards below pterostigma. Nodal crossveins rm and mcu beyond first M fork at nearly same level or rm much more distal. RP with three or four endings, crossvein ir present. Mediana with six or seven endings. Subapical crossvein series present. Clavus with veins fusing in its apical quarter. In hindwing, medial fold present, anterior and posterior branches of A_1 arising from anal fold about same point, and $A_1 + A_2$ with about three blind branches (sometimes forked). Legs relatively long. Hind tibia with single lateral spine distal to midlength, at apex with seven teeth (2 + 5) of main row and two or more teeth of additional row. First and second hind tarsomeres apically with seven to nine teeth bearing subapical setae.

Composition. Type species.

Comparison. This genus differs from the recent genus *Cixidia* Fieb. in the longer rostrum and flat (not longitudinally depressed) coryphe with raised median carina; CuA_2 in tegmen with two endings, not three as usual in *Cixidia.* A step-like break in the lateral carinae of mesonotal disc is similar only to their step-like bend in the recent Australian genera *Epiona* Em., *Anabunda* Em. and *Rhinochloris* Em. (Emeljanov, 2005).

Remarks. The description of the *Protepiptera kaweckii* holotype (not very detailed and lacking illustrations) does not contradict the genus being assigned to Achilini. In the shape of the head, with the coryphe placed far forwards and the occipital notch deep (up to anterior eye margins), and the length of the rostrum, as well as the body size and numerous other characters *Protepiptera kaweckii* is indistinguishable from *Cixidia christinae.* However, in the *C. christinae* holotype and our inclusions, the pronotal disc is transversely truncate anteriorly (Fig. 2c; in some, possibly desiccated specimens slightly angulately concave, Fig. 2d), whereas in the *P. kaweckii* holotype it was described as "roundly projecting anteriorly between the compound eyes." Among recent Achilini the shapes of coryphe and pronotum, most similar to those described by Usinger for *Protepiptera*, are found in the genera *Elidiptera* and *Messeis* Stål (see *M. fuscovaria* Stål: Fennah, 1950, text-fig. 10), but in these latter the coryphe lacks the median carina, its posterior margin parallels the arched anterior margin of pronotum, and the tegminal venation is strongly modified. In both *C. christinae* and *P. kaweckii* the posterior margin of coryphe is "concavely arcuate, subangulately so at middle." In Achilidae we failed to find the angulately concave posterior margin of coryphe combined with the arcuate anterior margin of pronotum. The dorsal side of the *P. kaweckii* holotype was "completely covered by a white cloud" (meaning that the insect body was somewhat decayed), therefore, the anterior margin of pronotum, deep inside the occipital notch, was less clearly seen than the posterior margin of coryphe (shape of the former was described in two words and of the latter in ten), and might even be slightly angulately protruding due to postmortem body inflation. Considering that in the original description of *P. kaweckii* the anterior margin of pronotum was described incorrectly, we accept *Protepiptera kaweckii* Us. = *Cixidia christinae* L., B. et N., syn. nov. This is the commonest species in our collection of Baltic amber Achilidae (11 of 27 specimens).

Possibly, *Protepiptera kaweckii* had been described even earlier as *"Cixius" longirostris* by Germar and Berendt, and as *"Oliarus" oligocenus* by Cockerell. Judging from the figure, in *"C." longirostris* the rostrum is somewhat not reaching the tip of the abdomen, the coryphe is narrowing anteriorly, and its occipital margin is shifted up to the anterior eye margins (however, the anterior margins of coryphe and pronotum are illustrated rounded). Apparently, the structure of the dorsal side, including tegminal venation, was poorly visible in the specimen (milky cover?). In particular, the figured basal branching sequence is completely unrealistic (with all veins up to Pcu separating from the base of radius); the achilid clavus is figured clearly enough, but veins on the membrane are not shown at all. *"O." oligocenus* agrees with *P. kaweckii* in the shape and proportions of head, course of carinae on mesonotum, venation, and dark pattern of tegmina.

***Protepiptera kaweckii* Usinger, 1939**

Plate 2, figs. 1–3

?"Cixius" longirostris Germar et Berendt, 1856.

?"Oliarus" oligocenus Cockerell, 1910.

Cixidia christinae Lefebvre, Bourgoin et Nel, 2007, syn. nov.

Neotype. PIN, no. 964/702, male(?); Upper Eocene, Baltic amber; right wings spread out, tip of left tegmen partly broken off, dorsal side with slight milky covering.

Description (Fig. 2). The body is brown with pale carinae of head and thorax; the face is infuscate along carinae, paler in between. Tegmina with variable yet characteristic dark pattern consisting of more or less broad infuscations along veins (veins themselves nearly all pale); patches along the costal area, in the middle parts of medial and usually of radial areas, spots at the nodus and at Pcu before its junction with A_1, and variable spots before subapical crossveins, pale. Hindwings are somewhat infuscated. In the specimens PIN, nos. 964/700 and 964/701 the plexus of anal veins is clearly seen in hindwings.

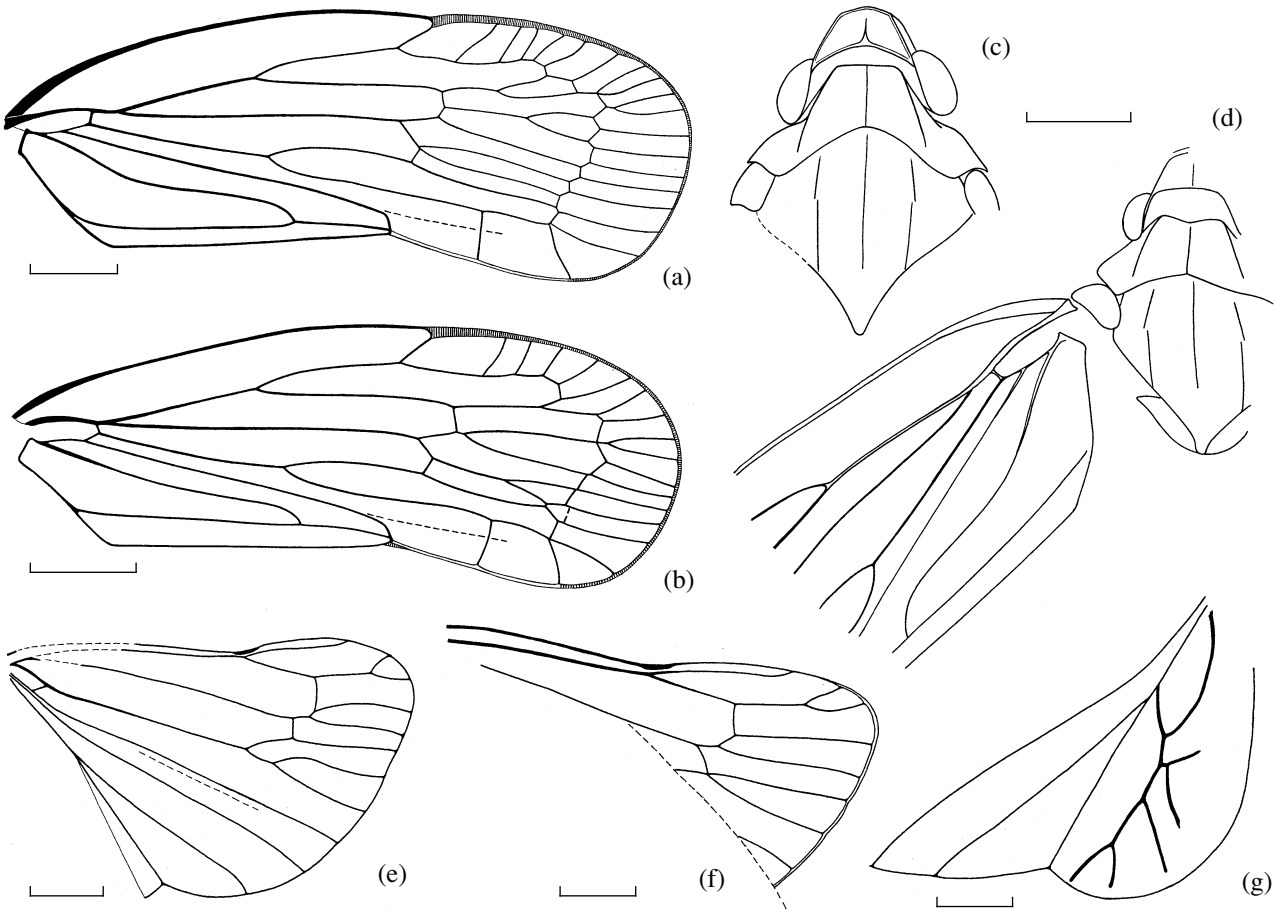

Fig. 2. *Protepiptera kaweckii* Usinger, 1939: (a, b) tegmen: (a) specimen PIN, no. 964/700; (b) neotype PIN, no. 964/702; (c) specimen PIN, no. 964/703, forebody, dorsal; (d) specimen PIN, no. 964/700, forebody and base of tegmen; (e–g) hindwing fragments: (e) neotype PIN, no. 964/702; (f) specimen PIN, no. 964/700; (g) specimen PIN, no. 964/701.

Measurements (mm): tegmen length, 6.3 (neotype) to 7.8.

Remarks. The location of the holotype is unknown; the original description does not indicate in which collection it was deposited. Therefore, in the interests of nomenclatorial stability it is reasonable to select a neotype.

Material. Neotype and specimens PIN, nos. 363/9, 363/18, 363/81, 364/383, 364/384, 364/389, 364/402, 964/700, 964/701, and 964/703 (964/700 and 964/701 broken across inclusions, wings exposed).

Genus *Psycheona* Emeljanov et Shcherbakov, gen. nov.

Etymology. From the Greek *psyche* (moth), for resemblance to some moths.

Type species. *Psycheona variegata* sp. nov., Upper Eocene, Baltic amber.

Diagnosis. Slender. Head small, together with eyes nearly twice narrower than mesonotum. Coryphe transverse, situated between eyes, nearly twice as wide as long, medially no shorter than at eyes, its anterior margin angulately convex, posterior one smoothly concave, lateral margins slightly diverging backwards; carinae distinct. Metope in profile convex, more so in its uppermost part (this part as seen in dorsal view no longer than coryphe), rather narrow, more than twice as long as wide, conspicuously widening downwards almost up to postclypeus. Eyes and antennae of usual proportions. Rostrum extremely long, quite slender, reaching tip of abdomen, with penultimate segment ca. 1.5 times as long as ultimate one, apex of penultimate segment reaching midlength of abdomen. Pronotum rather long, its lateral margins no less than 1.5 times as long as longitudinal eye diameter; disc not wide, about 1.5 times as long as wide anteriorly, its lateral carinae straight, diverging backwards at acute angle, in posterior quarter bent outwards (here giving off short, obscure posterodiscal carinae), and then ending blind. Lateral margins of upper side of pronotum sharply carinate, paranota without upper horizontal or any other carina. Mesonotum rather large, with anterior margin

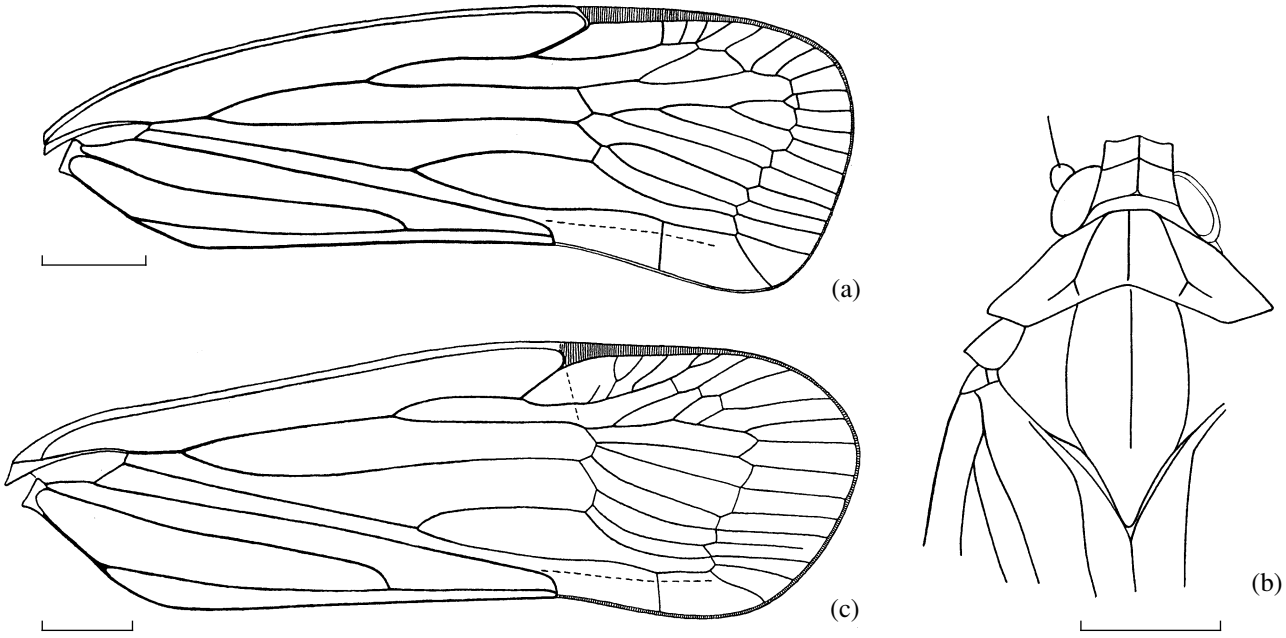

Fig. 3. Fossil Achilini: (a–b) *Psycheona variegata* gen. et sp. nov., holotype PIN, no. 964/698: (a) tegmen; (b) forebody, dorsal; (c) *P. striata* gen. et sp. nov., holotype PIN, no. 964/696, tegmen.

roundly obtusely angulate, posterior one forming acute, nearly right angle, slightly attenuated apically, and three subparallel carinae, lateral ones uninterrupted, slightly arched outwards, median one ending posteriorly level with apices of lateral carinae. Tegmen quite narrow, elongate, 2.8–3.1 times as long as wide, widened towards more or less obliquely rounded or truncate apex; membrane occupying slightly more than 1/3 of tegmen length; clavus with sutural area rather wide, shallowly inclined. Costal area without crossveins. R and M forming a common stalk about as long as basal cell. First fork of ScR approximately level with Pcu + A_1 junction in distal third of clavus; first fork of CuA somewhat more distal. Extravenal pterostigma well developed, more than twice as wide as costal vein. Stigmal cell with several crossveins. RA not arched backwards below pterostigma. RP anteriorly pectinate with four or five terminal branches. M beyond level of nodal crossveins rm and mcu with numerous branches, up to six branches on MA, two on MP. Subapical crossvein series rather regular. CuA_1 bent at nodal crossvein mcu, strongly arched backwards beyond it, so that area between CuA branches narrowed nearly three times. Legs slender, quite long, simple. Hind tibia more than twice as long as femur, with single lateral spine distal to midlength. Tibial apex with teeth arranged in three groups, together forming a kind of swallow tail, anterior group (from row containing lateral spines) of two teeth, middle group of two underdeveloped teeth, and posterior group of four or five teeth. First hind tarsomere long, apically with about ten teeth bearing subapical setae, second tarsomere short (number of teeth uncertain).

C o m p o s i t i o n. Two species described below.

***Psycheona variegata* Emeljanov et Shcherbakov, sp. nov.**

Plate 1, figs. 2 and 3

E t y m o l o g y. From the Latin *variegatus* (mottled).

H o l o t y p e. PIN, no. 964/698, male; Upper Eocene, Baltic amber.

D e s c r i p t i o n (Figs. 3a, 3b). Tegmina are subtransversely truncate apically. The veins are rather evenly distributed over the membrane. MA is 6-branched, posteriorly pectinate, five branches of pecten (third one forked) separating sequentially along the entire length of the membrane up to the subapical crossveins, without abrupt bends or subtransverse sections. MP is 2-branched, obliquely longitudinal at base, joining the crossvein mcu before the fork, without abrupt bends at mcu or elsewhere. The color pattern consists of dark spots at suffused brown background. The forebody is very dark with the carinae paler brown. The tegmina with dark spots, mostly arranged in indistinct transverse bands. The middle part of the costal area with three dark spots, the distal one somewhat better isolated than two others, from which two dark bands are extending to the posterior margin of tegmen; the cubital area and the prenodal part of CuA fork are dark. On the clavus the most distinct are the subbasal suffusion and a spot near the fork in the posterior cubital area. Membrane beyond nodal level with brown band, posteriorly turning towards wing apex, running anterior to CuA_1; apical cells are suffused from the first medial cell to posterior wing margin; a darker, rounded ocellar spot is situated in the last radial area and adjacent anteapical medial cell; another dark spot lies in the stigmal cell. The body venter is paler, as well as legs, except for the darker apical parts of the tibiae and tarsi.

Measurements (mm): tegmen length, 7.8.

Material. Holotype.

***Psycheona striata* Emeljanov et Shcherbakov, sp. nov.**

Plate 1, fig. 4

Etymology. From the Latin *striatus* (striped).

Holotype. PIN, no. 964/696; Upper Eocene, Baltic amber; most of abdomen and genitalia gnawed off after the planthopper had stuck to the resin (sex not determined).

Description (Fig. 3c). Tegmina are unevenly, obliquely rounded apically, more steeply at RP and CuA_2 branches, more flatly at M branches. The stigmal cell is crossed by the nodal fold and about four crossveins (sometimes forked). MA is 3-branched, all branches separating from its subtransverse base that forms a right angle with MA_2. MP is 2-branched, MP_2 running transversely before junction with the crossvein mcu. The body is brownish, the mesonotum with a pair of pale striae along the median carina; tegmina are suffused with dark, except the costal margin and stigmal cell. The hindwing is but partly visible, its base and jugal area are concealed.

Measurements (mm): tegmen length, 9.4.

Comparison. This species is distinct from the type species in the M branching pattern and in the more rounded, oblique apical margin of tegmen.

Material. Holotype.

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